Commonwealth of Kentucky
Division for Air Quality

PERMIT STATEMENT OF BASIS

Title V / PSD draft No. V-97-031 (Revision 3)
NORTH AMERICAN STAINLESS
GHENT, KY.
November 15, 1999
APRIL J. WEBB / REBECCA T. CASH
EIS Plant I.D.# 079-0580-0034
AFS Plant I.D. # 21-041-0034
Application Log # G020

SOURCE DESCRIPTION:
North American Stainless proposes to install an electric arc furnace melt shop, including an argon oxygenization decarbonizing vessel and a continuous caster for its stainless steel rolling mill near Ghent, Kentucky.. The emissions from the new points required a PSD review. The PSD review showed that none of the points have a significant impact on air quality. Therefore, no additional analyses were required.

COMMENTS:
The pickling line has a scrubber for control with a 97.5% control efficiency
The shotblaster is controlled by a cartridge filter with an efficiency of 99.9%

Emission factors are from AP-42, vendor certification, and material balance
Applicable regulation
401 KAR 59:010, New process operations
401 KAR 53:010, Ambient air quality standards

EMISSION AND OPERATING CAPS DESCRIPTION:
The pickling line and annealing furnace are limited to a combined 8 ton of NOxper 12 month rolling average.

PERIODIC MONITORING

For the 16.5 mmBTU per hour annealing furnace, periodic monitoring is demonstrated by the following:

1. The permittee assures compliance with the visible emissions from each stack on a monthly basis by performing a quantitative analysis. If visible emissions are noted a Reference Method 9 is to be preformed.
2. The permittee assures compliance with nitrogen oxide emission standard by calculating the emissions as described in the permit using emission factors and heating values of the natural gas.

3. While burning natural gas, these units are considered to be in compliance with PM, SO_2 and opacity standards.

For the pickling line, periodic monitoring is demonstrated by the following:
The permittee assures compliance with the HF and HNO_3 emissions by calculating the emissions as described in the permit.

CREDIBLE EVIDENCE:

This permit contains provisions which require that specific test methods, monitoring or recordkeeping be used as a demonstration of compliance with permit limits. On February 24, 1997, the U.S. EPA promulgated revisions to the following federal regulations: 40 CFR Part 51, Sec. 51.212; 40 CFR Part 52, Sec. 52.12; 40 CFR Part 52, Sec. 52.30; 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12, that allow the use of credible evidence to establish compliance with applicable requirements. At the issuance of this permit, Kentucky has not incorporated these provisions in its air quality regulations.

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1. EXECUTIVE SUMMARY

North American Stainless' proposal is to add a stainless steel melt shop to the existing operations. The facility will produce stainless steel that will be rolled in the existing rolling mill. The melt shop can produce 1,100,000 tons per year of stainless steel. North American Stainless' melt shop is to be equipped with one electric arc furnace (EAF) (154 tons per hour), one argon oxygen decarburization vessel (AOD) (165 tons per hour), one tundish preheater (6.16 mmBTU/hr),one SEN preheater (0.16 mmBTU/hr), one AOD preheater (17.06 mmBTU/hr), eight ladle pre-heaters (10.43 mmBTU/hr each), one ferro alloy/flux addition system, one continuous caster with torch cutting, slag processing, one lime hopper, one covered receiving bin/filling station, sludge disposal, scrap unloading, three evaporator coolers, three cooling towers, mold cooling system, spray and open machine cooling system, and a closed machine cooling system. Five stacks will be built. The EAF, lime hopper, and receiving bin / filling station exhaust out one stack, and the AOD unit, AOD preheater and eight ladle pre-heaters exhaust out another stack. The continuous caster with torch cutting, tundish preheater, and SEN preheater; the ferro alloy / flux addition; and the slag processing will each emit out of separate stacks..

Since potential emissions of nitrogen oxides, carbon monoxide, particulate matter (PM) and PM_{10} regulated air pollutants are in excess of 100 tons per year, Kentucky State Regulation 401 KAR 50:035, Permits, requires the source to obtain a federally-enforceable permit to construct and operate the proposed project. The proposed addition will also be a major source for PSD as defined in Kentucky State Regulation 401 KAR 51:017 (40 CFR 52.21), Prevention of significant deterioration (PSD) of air quality. The plant addition will make the source one of the 28 major source categories listed in 401 KAR 51:017 (40 CFR 52.21). Consequently, the proposed facility addition will change the source's SIC code.

The source is located in a county classified as attainment for each of these pollutants pursuant to Regulation 401 KAR 51:010, Attainment status designations. The potential emissions of nitrogen oxides, carbon monoxide, PM, and PM_{10} from this plant are more than 100 tons per year which is in excess of the significant net emission rates as presented in Regulation 401 KAR 51:017, Section 22. Consequently, the proposed facility addition meets the definition of a major stationary source and is subject to evaluation and review under the provisions of the PSD regulation for all these pollutants.

A PSD review involves the following six requirements:

1. Demonstration of the application of Best Available Control Technology (BACT).
2. Demonstration of compliance with each applicable emission limitation under Title 401 KAR Chapters 50 to 65 and each applicable emissions standard and standard of performance under 40 CFR 60, 61, and 63.
3. Air quality impact analysis.
4. Class I area impact analysis.
5. Projected growth analysis.
6. Analysis of the effects on soils, vegetation and visibility.

This source is also subject to Title V permitting requirements in accordance with 401 KAR 50:035, Permits, and 40 CFR Part 70. This permit represents the draft PSD/ revised Title V permit which establishes the enforceability of all applicable requirements.

2. BACKGROUND

On February 25, 1999, the Division received a permit application to construct and operate a meltshop from North American Stainless.

During the modeling analysis, NAS discovered that another source in the original significant impact area had allowables that caused violations of the NAAQS. This source had received a permit that required no modeling analysis. After adjusting certain parameters, with Division concurrence, NAS contributed less than 5 $\mu g/m^3$ to the modeled violations.

Additional information was requested and received on October 18, 1999.

The application was logged complete on November 1, 1999.

Information from the application is provided and assumed correct.

3. EMISSIONS ANALYSIS

Emissions were based on the maximum rated capacity of the plant and 8760 hours per year of operation for all units. The Kentucky Division for Air Quality has reviewed and accepted North American Stainless' emission estimates. Please refer to the application for the hourly and annual emission rates and pollutant identification for each respective emission unit. For further details please see Section 1, Section 3, and Amended Appendix A of the application.

4. REGULATORY REVIEW

This section presents a discussion on the air quality regulations applicable to this project. In some cases the processes are regulated by more than one regulation. In such cases, the more stringent requirements have been applied. The following regulations will apply to the proposed plant (please see the application for a detailed description of the plant and specific processes/units within the plant):

401 KAR 59:010, New process operations, applies to the ferro alloy / flux addition; continuous caster with torch cutting; slag processing; and lime hopper, covered receiving bin / filling station, and the EAF. Particulate limits imposed by 401 KAR 59:010 have been superceded by self-imposed

limits to maintain emission impacts below the PSD significant impact levels (SILs).

401 KAR 60:005, 40 CFR Part 60 Standards of performance for new stationary sources, incorporating by reference 40 CFR 60, Subpart AAa, Standards of Performance for Steel Plants: Electric Arc Furnaces and Argon-Oxygen Decarburization Vessels Constructed After August 17, 1983, applies to the EAF and AOD. The Subpart AAa result in applicable standards for particulates and opacity. The PM standard is 12 mg/dscm (0.0052 gr/dscf); however, the proposed BACT limit is less (~10 mg/dscm).

Subpart AAa also requires the owner or operator to record the control system fan motor amperes and damper positions or to install a continuous emission monitor for recording the volumetric flow rate at the baghouse to determine PM/PM_{10} emissions. Periods of excess emissions must be reported. Monitoring, testing, reporting, and record keeping requirements also apply. A performance test is required for PM/PM_{10} emissions. Please see the permit for further details.

401 KAR 51:017 (40 CFR 52.21), Prevention of significant deterioration of air quality, applies to the proposed construction. This has been determined by evaluating four criteria. These criteria are the attainment area designation, the major/minor source designation, the source's or addition's SIC code, and the potential emissions of the addition. First, Carroll County is currently designated as "attainment" for all pollutants pursuant to Regulation 401 KAR 51:010, Attainment status designations and 40 CFR 81.318. Second, the source is currently considered to be minor as defined in 401 KAR 51:017; and therefore, only subject to PSD if the modification is major. Third, the proposed plant addition's SIC code is one of the 28 listed categories. Sources listed in the 28 categories have a major source threshold of 100 tons per year for all criteria pollutants. Lastly, the addition will be major because it has the potential to emit more than 100 tons per year of one or more regulated criteria pollutant.

Subsequent to determining 401 KAR 51:017 applicability, the Division determined potential emission rates. The potential emissions of all criteria pollutants including fugitive emissions for the melt shop addition are as follows:

Pollutant	**PTE * (tons per year)**	**Significant Emission Rate ** (tons per year)**
Nitrogen oxides	651	40
Carbon monoxide	2364	100
Sulfur Dioxide	1.09	40
Particulate	159	25
Particulate matter (PM_{10})	159	15
Volatile organic compounds	90	40
Lead	1.6	0.6

* PTE - Potential to emit, emissions for all sources calculated with 8760 hours/year.
** Significant emission rate as given in Regulation 401 KAR 51:017, Section 22.

Based on this comparison, 401 KAR 51:017 applies to all criteria pollutants except for sulfur dioxide and the applicant performed a best available control technology (BACT) demonstration and an ambient air quality analysis. Each of these components of the PSD review process will be discussed in detail in the following sections. From the BACT determinations and the ambient air quality analysis, the following self-imposed limits have been proposed by North American Stainless to fulfill PSD requirements and preclude further modeling analysis for all significant pollutant emissions except for lead. These limits will also satisfy requirements of 59:010, 59:015, and Subpart AAa. The limits are as follows:

Emission Point	NOx Limit	PM Limit	Lead Limit	CO Limit
EAF	71.83 lb/hr	13.94 lb/hr	0.167 lb/hr	266.02 lb/hr
AOD	71.29 lb/hr	16.98 lb/hr	0.204 lb/hr	264.70 lb/hr
AOD preheater	0.85 lb/hr	combined with AOD	8.53E-6 lb/hr	1.43 lb/hr
Tundish Preheater	0.31 lb/hr	combined with the continuous caster	3.08E-6 lb/hr	0.517 lb/hr
SEN Preheater	0.008 lb/hr	combined with the continuous caster	8.0E-8 lb/hr	0.0134 lb/hr
Ferro alloy/Flux addition system	NA	1.44 lb/hr	NA	NA
Continuous Caster with Torch Cutting	NA	1.77 lb/hr	NA	NA
Slag processing	NA	0.81 lb/hr	NA	NA
Lime Hopper	NA	combined with EAF	NA	NA
Covered Receiving Bin/ Filling Station	NA	combined with EAF	NA	NA
Sludge Dumping	NA	6.03 E-5 lb/hr	NA	NA
Scrap Unloading	NA	5.27 E-6 lb/hr	NA	NA
Evaporator Cooler --EAF	NA	0.81 lb/hr	NA	NA
Evaporator Cooler --AOD Converter	NA	0.022 lb/hr	NA	NA
Cooling Tower	NA	0.17 lb/hr	NA	NA
Evaporator Cooler / Off Gases	NA	0.082 lb/hr	NA	NA
Cooling Tower / Miscellaneous	NA	0.04 lb/hr	NA	NA
Cooling Tower / CC Plant	NA	0.06 lb/hr	NA	NA
Mold Cooling System	NA	0.05 lb/hr	NA	NA
Spray and Open Machine Cooling System	NA	0.06 lb/hr	NA	NA
Closed Machine Cooling System	NA	0.034 lb/hr	NA	NA
Paved Roads	NA	1.38 E-4 lb/hr	NA	NA

Eight Ladle preheaters	0.52 lb/hr each	combined with AOD	5.22E-6 lb/hr each	0.876 lb/hr each

5. BEST AVAILABLE CONTROL TECHNOLOGY REVIEW

Pursuant to 401 KAR 51:017, Section 9(1) and (2), a major stationary source subject to a PSD review shall meet the following requirements,

(a) The proposed source shall apply the best available control technology (BACT) for each pollutant that it will have the potential to emit in significant amounts.

(b) The proposed source shall meet each applicable emission limitations under Title 401 KAR 50 to 65, and applicable emission standards and standards of performance under 40 CFR 60, 61, and 63.

The proposed addition will be a major source resulting in emissions of nitrogen oxides, carbon monoxide, PM, PM_{10}, volatile organic compounds, and lead that exceed the corresponding PSD net significant emission amounts. Therefore, each of these pollutants shall be subject to a BACT review.

North American Stainless has presented in the permit application, a study of the best available control technology for each pollutant and each emission unit in the proposed addition. The Division has reviewed the proposed control technology and consulted information available through the U.S. EPA's RACT/BACT/LAER Clearinghouse (RBLC) database. A summary of the control technology determined to be the best available control technology for each pollutant and each emissions unit is presented below:

A. Electric Arc Furnace

EIS No.	Emissions Unit/Process	Pollutant	Best Available Control Technology	Emission Standard
57(26)	Electric Arc Furnace	NO_x	Good operating and maintenance procedures	71.83 lb/hr
		CO	Fourth hole evacuation or DEC	266.03 lb/hr
		Lead	Baghouse	0.134 lb/hr
		VOC	Only 20% Oily or painted scrap will be used	19.95 lb/hr
		PM/PM_{10}	Baghouse	10 mg/Nm^3

B. Argon-Oxygen Decarburization Vessel (AOD)

EIS No.	Emissions Unit/Process	Pollutant	Best Available Control Technology	Emission Standard
58(27)	Argon Oxygen Decarburization Vessel	NO_x	Good operating and maintenance procedures	71.83 lb/hr
		CO	Fourth hole evacuation or DEC	266.03 lb/hr
		Lead	Baghouse	0.102 lb/hr
		PM/PM_{10}	Baghouse	10 mg/Nm^3

C. Natural Gas Preheaters

EIS No.	Emissions Unit/Process	Pollutant	Best Available Control Technology	Emission Standard
59 (28)	AOD Preheater		Good combustion control for all pollutants	
		NO_x	Low NO_x technology/	0.853 lb/hr
		CO		1.44 lb/hr
		SO_2	Low sulfur natural gas fuel	0.01 lb/hr
		PM/PM_{10}	Natural gas as fuel/low ash fuel	0.0007 lb/hr
		Lead	Natural gas as fuel/low ash fuel	0.000009 lb/hr
49-56 (49-56)	Ladle Preheaters		Good combustion control for all pollutants	Per Ladle
		NO_x	Low NO_x technology/	0.5216 lb/hr
		CO		0.876 lb/hr
		SO_2	Low sulfur natural gas fuel	0.006 lb/hr
		PM/PM_{10}	Natural gas as fuel/low ash fuel	0.0004 lb/hr
		Lead	Natural gas as fuel/low ash fuel	0.000005 lb/hr
29 (29)	Tundish Preheater		Good combustion control for all pollutants	
		NO_x	Low NO_x technology/	0.308 lb/hr
		CO		0.0.517 lb/hr
		SO_2	Low sulfur natural gas fuel	0.004 lb/hr
		PM/PM_{10}	Natural gas as fuel/low ash fuel	0.0003 lb/hr
		Lead	Natural gas as fuel/low ash fuel	0.000003 lb/hr
30(30)	SEN Preheater		Good combustion control for all pollutants	
		NO_x	Low NO_x technology/	0.008 lbs/hour
		CO		0.013 lb/hr
		SO_2	Low sulfur natural gas fuel	0.000096 lb/hr
		PM/PM_{10}	Natural gas as fuel/low ash fuel	0.000006 lb/hr
		Lead	Natural gas as fuel/low ash fuel	0.00000008 lb/hr

D. Cooling Towers

EIS No.	Emissions Unit/Process	Pollutant	Best Available Control Technology	Emission Standard
41 (41)	Cooling Tower	PM/PM_{10}	Good operating and maintenance procedures for all cooling towers	0.17 lb/hr
43(43)	Cooling Tower / Miscellaneous	PM/PM_{10}		0.04 lb/hr
44 (44)	Cooling Tower / CC Plant	PM/PM_{10}		0.057 lb/hr

E. Continuous Caster with torch cutting

EIS No.	Emissions Unit/Process	Pollutant	Best Available Control Technology	Emission Standard
32 (32)	Continuous Caster with torch cutting	PM/PM_{10}	Baghouse	0.04 lb/hr

F. Slag Handling

EIS No.	Emissions Unit/Process	Pollutant	Best Available Control Technology	Emission Standard
33 (33)	Slag Handling	PM/PM_{10}	Baghouse	0.005 lb/hr

G. Material Handling and Storage

EIS No.	Emissions Unit/Process	Pollutant	Best Available Control Technology	Emission Standard
31 (31)	Ferro alloy / Flux addition system	PM/PM_{10}	Baghouse	0.007 lb/hr
34(34)	Lime Hopper	PM/PM_{10}	Baghouse	0.00002 lb/hr
36(36)	Covered Receiving Bin / Filling Station	PM/PM_{10}	Baghouse	0.008 lb/hr
37(37)	Sludge Dumping	PM/PM_{10}	The sludge will have a high moisture content to prevent emission of particulate.	0.003 lb/hr
38(38)	Scrap Unloading	PM/PM_{10}	Only “clean” scrap will be used. The scrap unloading area will be located on a paved containment area, and inside a building with the AOD and EAF.	0.09 lb/hr

H. Paved Roads

EIS No.	Emissions Unit/Process	Pollutant	Best Available Control Technology	Emission Standard
48(48)	Paved Roads	PM/PM_{10}	Roads will be paved to decrease emissions from traffic.	1.89 lb/hr

The permittee submitted a top-down Best Available Control Technology (BACT) analysis following the U.S. EPA guidance, “New Source Review Workshop Manual” (U.S. EPA, October 1990). The key steps involved with the top-down BACT process are as follows:

1. Identify all control technologies
2. Eliminate technically infeasible options
3. Rank remaining control technologies by control effectiveness
4. Evaluate most effective controls considering economic, environmental, and energy impacts, and document results
5. Select BACT.

A-B. BACT for Electric Arc Furnaces and Argon-Oxygen Decarburization Vessels

This project is being proposed as a melt hop addition to an existing rolling mill. Scrap stainless steel is melted and cast in the new addition, and rolled in the existing facility. Due to recent economic developments in the stainless steel industry, North American Stainless now feels that they need to supply their own stainless steel for rolling so that they can continue to be competitive in the stainless steel field.

North American Stainless will operate the EAF and AOD as batch processes that will charge, melt, and tap stainless steel using a maximum of 90% stainless steel scrap. The emissions from the EAF and AOD will be captured using the fourth hole evacuation or direct evacuation control system (DEC) and canopy and doghouse collection systems.

The high temperatures used to melt stainless steel result in difficulties with applying various control technologies to this project. A discussion of the decisions and situations surrounding the BACT for this project follow.

NO_x

Nitrogen oxides are primarily formed in the melting process in two ways: (1) the combination of elemental nitrogen and oxygen in the air within the high temperature environment of the melter (thermal nitrogen oxides), and (2) the oxidation of nitrogen contained in the scrap. The rate of formation of thermal nitrogen oxides is a function of residence time and free oxygen.

The permittee's application, page 13, Section 5.1, has a list of possible control technologies for nitrogen oxides. BACT determinations for EAFs and AODs taken from the BACT/RACT/LAER Clearinghouse demonstrate no applicable control technology for either. The Division's review of previous permitting actions in other states reveals no control technology as being feasible for BACT limitations of NO_X. The following discussion indicates the decision and situation surrounding BACT for this electric arc furnace project.

The first step in the top-down BACT approach is to identify all control technologies. These control technologies have been identified to include flue gas recirculation, selective catalytic reduction, and selective non-catalytic reduction.

One function of the addition of flue gas recirculation is the recycling of a portion of the flue gas back into the combustion zone to lower the oxygen concentration in the combustion zone. By recycling the flue gas there is less oxygen in the air to combine with the released nitrogens. Flue gas recirculation is available for this project, however, unstable gas temperatures result from the recirculation. Therefore, additional burners would have to be installed to stabilize the gas temperature. Stabilizing the temperature in the EAF would cause the stainless steel to be improperly processed. The Division agrees that flue gas recirculation is an unfeasible technology and further analysis is not required.

Selective catalytic reduction (SCR) is used to lower NO_X emissions. This technology uses the injection of ammonia diluted with air into the exhaust stream upstream of a catalyst bed. On the downstream catalyst surface, ammonia reacts to form molecular nitrogen and water. In order for this system to work efficiently, the air flow, temperature and NO_X concentrations must be relatively stable, and the gas stream must be free of excessive particulates. The optimum temperature range for the SCR reactions is between 500 and 1000 degrees Fahrenheit. The metal particulate emissions would act as a poison to the catalyst rendering it ineffective. Therefore, SCR is considered to be an unfeasible control technology and further analysis is not required.

Another inherently lower emitting nitrogen oxides control process is selective non-catalytic reduction (SNCR). SNCR is an emerging technology that uses either ammonia or urea injected into the system. The optimum temperature range for the reactions is 1600 to 2300 degrees Fahrenheit. NO_X reduction of 0-50% may be achieved with NH_3:NO_X molar ratios of 1:1 to 2:1. SNCR requires a steady exhaust temperature, exhaust flow, and steady NO_X formation. None of these conditions are present in an EAF or AOD. Due to the difficulties encountered in determining the appropriate time to inject the ammonia or urea, SNCR is not a feasible control technology.

Therefore, the Division agrees there are no feasible control technologies for NO_X for an EAF or AOD.

<u>CO</u>

Carbon monoxide is formed when the carbon in the steel, and the carbon in the electrode reach the oxygen from the ambient air. CO is generated during charging, melting, and tapping of the heat cycle. During melting and refining, the emissions are released into the DEC. For CO control, the permittee evaluated the available control technologies which are: direct evacuation controls (DEC), duct burners, flaring of CO emissions, CO oxidation catalysts, thermal incineration, and catalytic incineration. Since North American Stainless has chosen what the Division considers to be the best control technology (based on NSPS and review of EPA BACT/RACT/LAER Clearinghouse), no further analysis of control technologies is needed.

<u>VOC</u>

The permittee documents that VOC emissions originate from impurities in the old scrap stainless steel that are released when melted. North American Stainless will implement a scrap management plan to minimize potential VOC emissions and to maintain the quality of the stainless steel through stringent specifications on the organic impurities content of the scrap. Currently, there is no feasible control technology available to effectively reduce VOC emissions. The Division concurs with this determination; therefore, the BACT analysis is considered to be complete.

PM/PM_{10}

Particulate emissions are generated throughout the heat cycle. To capture PM emissions during charging, the DEC or fourth hole duct will be used. For the remaining portion of the heat cycle, emissions will be captured by the doghouse and canopy hood. The captured EAF flue gases will be vented through a baghouse with a total flow of 1,150,000 meters cubed per hour, and a control efficiency of 99.5%. The Division has found through the EPA BACT/RACT/LAER clearinghouse and BLIS database that fabric filters/baghouses are considered BACT for control of EAF/AOD PM emissions.

Lead

Particulate emissions are generated throughout the heat cycle. A percentage of the particulate emissions are lead. The BACT analysis for lead is the same as the BACT analysis for $PM/PM_{10.}$ The Division agrees that fabric filters/baghouses are considered BACT for control of EAF/AOD lead emissions.

C. AOD preheater, Ladle preheaters, Tundish preheater, SEN preheater

The permittee has submitted modeling analysis of the ambient impact predicted to occur due to the melt shop project. The permittee has indicated that these preheaters will only use low NO_X burners with natural gas and emit out stacks with baghouses for particulate control. The Division considers this to be BACT

NO_x, CO, and PM/PM_{10}

The permittee indicates that emissions are far too low for most control technologies to be cost effective. The permittee documents that low NOx burners will be used to control NO_X emissions and baghouses will be used to control PM/PM_{10} emissions. The Division has accepted the permittee's proposal and agrees that other technologies will be cost prohibitive.

D. Cooling Towers

PM/PM_{10}

The permittee documents that the BLIS database does not list any control devices for cooling towers at steel plants. The use of baghouses or ESPs is documented to be technically infeasible and that these do not represent an available control technology. The Division accepts the permittee's proposal for the use of good operating procedures as BACT for particulate emissions from the cooling towers and no further analysis is required.

E. Continuous Caster with Torch Cutting

PM/PM_{10}

The permittee documents that the BLIS database and U.S. EPA documents list canopy hoods with baghouses or just baghouses as being BACT for continuous casters. The Division accepts the permittee's proposal that use of a baghouse is BACT for particulate emissions from the continuous casters and no further analysis is required

F. Slag Handling

PM/PM_{10}

The slag produced from the EAF will be transported in a slag pot to the deslagging, crushing, and mill area for cooling and processing. Any particulate emissions generated during the skimming processes will be vented from the EAF baghouse. All EAF slag processing will be conducted inside buildings. The emissions from the deslagging and crusher buildings will be vented to a baghouse. In addition water will be sprayed onto the slag for cooling. Once the slag is crushed, the materials will undergo wet screening and further wet crushing to separate the metals from impurities. The wet recovered metals will be loaded onto a truck and the remaining impurities will be discharged to the lagoon.
The slag produced from the AOD will be dust-like material that will be collected and stored in a silo. A portion of the AOD slag will be mixed with powdered lime, and dust from the EAF and AOD, and pneumatically injected into the bath of EAF. Any particulate emissions generated during skimming from the AOD will be controlled by the AOD baghouse.

The permittee documents that the BLIS database and U.S. EPA documents list water spray as a pollution prevention method for an EAF; however, there are no reports describing particulate controls for slag handling from an AOD. The Division accepts the permittee's proposal for the use of water suppression for the slag handling as BACT for particulate emissions and no further analysis is required

G. Material Handling and Storage (scrap unloading, ferro alloy and flux handling, lime hopper, sludge handling

PM/PM_{10}

The permittee documents that the BLIS database lists covered conveyors, unloading of materials in sheds, use of sealed hopper at rail cars, enclosed conveyors, filters on storage silos, and truck loading areas for baghouse waste having a three-sided enclosure as BACT for material handling and storage. The permittee has proposed these controls and the Division has accepted the permittee's proposal that building enclosures and baghouses where applicable is BACT for particulate emissions from material handling and storage. Therefore, no further analysis is required

H. Roadways

$\underline{PM/PM_{10}}$

The permittee will have all roadways paved to minimize any dust suspension from vehicular traffic. To further minimize dust from transportation of materials, a rail system will be installed. According to BLIS, BACT for fugitive emissions from roads is the paving, and/or cleaning of the roads by using a vacuum or flushing system throughout the week. The Division accepts the permittee's proposal that paving roadways is BACT for particulate emissions from roads. Therefore, no further analysis is required.

6. AIR QUALITY IMPACT ANALYSIS

Pursuant to 401 KAR 51:017, Section 12, an application for a PSD permit shall contain an analysis of ambient air quality impacts in the area that the proposed facility will affect for each pollutant that it will have the potential to emit in significant amounts as defined in Section 22 of the same regulation. The purpose of this analysis shall be to demonstrate that allowable emissions from the proposed source will not cause or contribute to air pollution in violation of:

(1) A national ambient air quality standard in an air quality control region; or
(2) An applicable maximum allowable increase over the baseline concentration in an area.

For pollutants for which no ambient air quality standard has been established, the analysis shall contain the air quality monitoring data the cabinet determines necessary to assess ambient air quality for that pollutant in an area that the emissions of that pollutant will affect. For pollutants (other than nonmethane hydrocarbons) for which a standard does exist, the analysis shall contain continuous air quality monitoring data gathered to determine if emissions of that pollutant will cause or contribute to a violation of the standard or a maximum allowable increase. The proposed facility will have potential emissions in excess of the significant net emission rates for nitrogen oxides, PM/PM_{10}, volatile organic matter, carbon monoxide, and lead.

A. Modeling Methodology

The application for the proposed source contains an air dispersion modeling analysis for criteria pollutants (nitrogen oxides, PM/PM_{10}, lead, and carbon monoxide) to determine the maximum ambient concentrations attributable to the proposed plant for each of these pollutants for comparison with:

1. The significant impact levels (SIL) found in 40 CFR 51.165 (b)(2).
2. The significant monitoring concentrations (SMC) found in 401 KAR 51:017, Section 24.
3. The PSD increments found in 401 KAR 51:017, Section 23.
4. The National Ambient Air Quality Standards (NAAQS) found in 401 KAR 53:010, Ambient air quality standards.

All of the applicable air quality criteria are presented in Table 3. Based on the U.S. EPA suggested procedures, if the maximum predicted impacts for any pollutant are found to be below the SILs, then it is assumed that the proposed facility cannot cause or contribute to a violation of the PSD pollutant increments or the national ambient air quality standards (NAAQS). Therefore, no further modeling would be required for such a pollutant. The applicant may also be exempted from the ambient monitoring data requirements if the impacts are below the significant monitoring concentrations.

Table 3

Pollutant	**Averaging Period**	**SIL** (μg/m^3)	**SMC** (μg/m^3)	**PSD Class II Increments** (μg/m^3)	**NAAQS** (μg/m^3)
NO_x	Annual	1	14	25	100
PM_{10}	Annual 24-hour	1 5	NA 10	17 30	50 150
CO	8-hour 1-hour	500 2000	575 NA	NA NA	10000 40000
Lead	3-month	NA	0.1	NA	1.5

The permittee used the Industrial Source Complex Short Term model (ISCST3, Version 99155) in the analysis. The ISCST3 model fulfills the requirements of Supplement C of the Guideline on Air Quality Models (Appendix W to 40 CFR 51). All of the parameters used in the modeling analysis for each pollutant appear satisfactory and consistent with the prescribed usage for this model. Per EPA guidance, the ISCST3 model was run with the regulatory default option in a sequential hourly mode using five consecutive years of meteorological data. Surface data and concurrent upper air data used were based on weather observations taken at the National Weather Service (NWS) station at the Covington/ Greater Cincinnati airport from 1987 to 1991. Although data for 1995 to 1997 are available, the cloud cover/ceiling height observations obtained through Automated Surface Observation System (ASOS) which became operational in August 1995, are inconsistent with the EPA meteorological processing guidelines for determining atmospheric stability. Thus, this more recent data were not used.

B. Modeling results - Class II Area Impacts

The proposed facility will be located in Carroll County, a Class II area. The permittee modeled the impact of the emissions from the proposed facilities on the ambient air quality and the results of the modeled impacts on the Class II area have been presented in the Table 4.

Using the self-imposed limits, the modeling results show (Table 4) that the maximum impacts from the proposed facility for NO_x, PM_{10}, and CO are less than the EPA prescribed significant ambient impact levels (SIL). These concentrations are also below the significant monitoring concentrations (SMC) found in 401 KAR 51:017, Section 24. Since the maximum predicted impacts for each pollutant are found to be below the SILs, then it is assumed that the proposed facility cannot cause or contribute to a violation of the PSD pollutant increments or the national ambient air quality standards (NAAQS). Therefore, no further modeling is required at this time. The applicant is also exempted from the ambient monitoring data requirements since the impacts are shown to be below the SMC.

Table 4

Pollutant	**Averaging Period**	**SIL** (μg/m^3)	**SMC** (μg/m^3)	**Max Impact of NAS Addition Emission** (μg/m^3)
NO_2	Annual	1	14	0.97251
PM_{10}	Annual 24-hour	1 5	NA 10	0.89 4.9
Lead	Calendar quarter	NA	0.1	0.0034
CO	8-hour 1-hour	500 2000	575 NA	115.96295 315.08289

C. Modeling Results - Class I Area Impacts

The nearest federally designated Class I area to the project site is Mammoth Cave National Park. Mammoth Cave is over 180 km southwest of the proposed facility. Based on the results of the dispersion analysis of the proposed project's emissions, summarized in the application Section 6.4, it is demonstrated by the permittee that the impacts of the North American Stainless facility are less than the EPA-instituted Class I significant levels (established through the proposed New Source Review Reform regulations). Thus, the permittee documents that a comprehensive cumulative Class I increment and NAAQS analysis is not required.

PSD also requires a demonstration that the proposed source's emissions would not adversely affect a Class I area's air quality related values (AQRV). Since the proposed source will be located more than 100 km from the nearest Class I area and insignificant impacts were observed for the modeling to the boundary of that area, no additional modeling was required.

A table showing the concentrations at Class I area receptors and comparison with the Class I PSD significant impact levels is found below.

Table 5

Pollutant	**Averaging Period**	**Maximum Concentration** (μg/m^3) **Mammoth Cave NP**	**PSD Class I SIL** (μg/m^3)
NO_2	Annual	0.0046	0.1
PM_{10}	24-hour	0.11	0.3
PM_{10}	Annual	0.0025	0.2

7. ADDITIONAL IMPACTS ANALYSIS

A. Growth Analysis

The consultant documents the following information for the proposed facility:
The project is not expected to have any growth-inducing effects on the local area. North American Stainless' melt shop project expects to employ local personnel for the construction phase. The project will employ approximately 50 personnel on a permanent basis. It is a goal of NAS to hire from the local community where possible. There should be no substantial increase in community growth. The proposed project is also not expected to result in a substantial increase in secondary emissions associated with non-project related activities. Thus, in accordance with PSD guidelines, the analysis of ambient air quality impacts need consider only emissions from the facility itself.

B. Soils and Vegetation Impacts Analysis

The consultant documents the following information for the proposed expansion:
The project lies in an area of three distinct geologic areas: upland areas, a glacial outwash terrace, and a floodplain area of the Ohio River. There are three types of effects that air contaminants have on vegetation. These are acute, chronic and long-term. The acute effects may result from short term exposure to high concentrations of air contaminants. Chronic effects can result from exposure to low levels of contaminants over time. Long-term effects result in changes that can last for decades or longer. Based on the concentration of PM, the atmospheric particulates are not known to pose a problem for these soils, but they may be a threat to vegetation when large concentrations and sufficient moisture cause a localized effect on the vegetation. The impact of the particulates is expected to be insignificant because of the small overall impact within the industrial area and the mitigating effect of rain.
Nitrogen dioxide can produce nitric acid in the atmosphere when mixed with water. Adverse effects on vegetation are not typically observed unless NO_X concentrations exceed 2,000 micrograms per meter cubed. Due to the modeled results of NO_X from the proposed project, neither acute nor

chronic effects are expected. No significant off-site impacts are expected from the proposed action. Therefore, the potential for adverse impacts to either soils or vegetation is minimal. The project's potential to impact its surroundings, based on the facility's potential to emit and resulting model-predictions of maximum ground level concentrations of PM/PM_{10}, lead, volatile organic matter, nitrogen oxides, and carbon monoxide is discussed. The minimum impact level numbers in micrograms per cubic meters are not exceeded by the maximum impact concentration of the North American Stainless project for volatile organic matter, PM/PM_{10}, nitrogen dioxide, or carbon monoxide. Therefore, it is concluded that no adverse impacts will occur to sensitive vegetation, crops or soil systems as a result of operation of the proposed facility.

C. Visibility Impairment Analysis

The consultant's information indicates that the proposed facility will comply with all requirements listed in 401 KAR 59:010 and 401 KAR 59:015 (regarding particulate and visible emissions); therefore, no significant impact to visibility within Class II area is expected to occur. On the basis of the insignificant modeling results presented in the application Section 6.0, it is also concluded that the facility will have no adverse impact on local visibility, since the significant impact levels are lower than the secondary NAAQS.

8. CONCLUSION AND RECOMMENDATION

In conclusion, considering the information presented in the application, the Division has made a preliminary determination that the proposed source should meet all applicable requirements:

1. All the emissions units are expected to meet the requirements of BACT for each significant pollutant. Additionally, each applicable emission limitation under 401 KAR Chapters 50 to 65 and each applicable emission standard and standard of performance under 40 CFR 60, 61, and 63 will be met.

2. Ambient air quality impacts on Class II areas are expected to be below the significant impact levels. No impact is expected on any Class I area.

3. Modeling for North American Stainless' proposed addition has demonstrated areas currently not owned by the company that have significant modeled impacts. The discussion and conclusions presented in this document are contingent upon acquisition of these areas.

4. Impacts on soil, vegetation, and visibility have been predicted to be minimal.

A draft permit containing conditions which may ensure compliance with all the applicable requirements listed above has been prepared by the Division. The Division recommends the issuance of the permit following the public notice period, and after the resolution of any adverse comments received by the Division.